

## NISTTech

### Covalently Immobilized Fluorinated Carboxylic Acid Stationary Phase for Liquid Chromatography

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#### A novel chromatography column-packing material with molecular shape recognition at high temperatures

##### Description

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This invention is a stationary phase material or column-packing material for liquid chromatography. The stationary phase is a series of fluorinated stationary phases with molecular shape recognition at high temperatures for reversed-phase liquid chromatography (RPLC). The chromatographic material is synthesized from linear chain perfluorinated carboxylic acids that range in length (C6 to C18) and are bound to modified silica. The end result is a chromatographic sorbent material that contains an aminoalkyl spacer and a perfluorinated alkyl chain connected through an amide linkage.

##### Applications

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- **Liquid Chromatography, preparative and analytical separations**  
Biological samples (complex aqueous samples with shape constrained molecules); Pharmaceutical compounds (e.g., halogen-containing anti-inflammatory drugs); Emerging contaminants (e.g., flame retardants and herbicides)
- **Pharmaceutical industry**
- **Clinical, forensic/toxicology, and food/nutrition laboratories**

##### Advantages

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- **Shape recognition up to at least 70 °C**
- **High temperature (shape selective) separations**
- **Fast and efficient separations due to good diffusion at elevated temperatures**
- **Use of very aqueous mobile phases**

##### Abstract

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A stationary phase for a liquid chromatography and process for making is provided. The stationary phase material may have a modified base substrate and a fluorinated carboxylic acid covalently bonded thereto through an amide or ester bond. The stationary phase may have a substantially consistent shape selectivity characteristic with an  $\alpha$ .sub.TBN/BaP of less than 1 within a temperature range of at least 10-70.degree. C. Advantageously, a fluorinated stationary phase has a shape selectivity characteristic exhibited with an  $\alpha$ .sub.TBN/BaP of less than 1 with a mobile phase having up to at least 30% water. A process for making the stationary involves mixing a substrate material or fluorinated carboxylic acid with a reactive alkylsilane linker and at least one organic solvent to form a first solution. The other of the substrate material or fluorinated carboxylic acid is then added to the first solution, or to a product separated from the first solution, to form a second solution. The second solution is reacted to form the stationary phase.

##### Inventors

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##### References

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- U.S. patent # 7,794,837 issued 2/12/2009, expires 08/06/2028
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##### Status of Availability

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This invention is available for licensing exclusively or non-exclusively in any field of use.

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